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appear so simple. We tried our dogs by putting a piece of bread before them and prevented them from touching it until we had counted seven. To prevent ourselves from unintentionally giving any indication, we used a metronome (the instrument used for giving time when practicing the pianoforte), and to make the beats more evident we attached a slender rod to the pendulum. It certainly seemed as if our dogs knew when the moment of permission had arrived; but their movement of taking the bread was scarcely so definite as to place the matter beyond a doubt. Moreover, dogs are so very quick in seizing any indication given them, even unintentionally, that, on the whole, the attempt was not satisfactory to my mind. I was the more discouraged from continuing the experiment in this manner by an account Mr. Huggins gave me of a very intelligent dog belonging to him. A number of cards were placed on the ground numbered respectively 1, 2, 3, and so on up to 10. A question is then asked: the square root of 9 or 16, or such a sum as $6 \times 52 - 3$. Mr. Huggins pointed consecutively to the cards, and the dog barked when he came to the right one. Now Mr. Huggins did not consciously give the dog any sign, yet so quick was the dog in seizing the slightest indication that he was able to give the correct answer. This observation seems to me of great interest in connection with the so-called "thought reading." No one, I suppose, will imagine that there was in this case any "thought reading" in the sense in which this word is used by Mr. Bishop and others. Evidently "Kepler" seized upon the slight indication unintentionally given by Mr. Huggins. The observation, however, shows the great difficulty of the subject.

I have ventured to bring this question before the section, partly because I shall be so much obliged if any lady or gentleman present will favor me with any suggestions, and partly in hope of inducing others with more leisure and opportunity to carry on similar observations, which I cannot but think must lead to interesting results.—*English Mechanic*.

ANTHROPOLOGY.¹

SOME MOOT POINTS IN AMERICAN ARCHÆOLOGY.—American archæological science, though continuously gathering strength, is, nevertheless, in a sense still far from manly development. There are celebrated institutions guarding with jealous care objects of inestimable worth; preëminent among these, the American Antiquarian Society (to commence with the oldest), the Smithsonian Institution, the Peabody Museum, the American Museum of Natural History, the Davenport Academy of Sciences, as well as those at Cincinnati and St. Louis; there are smaller institutions whose collections are of almost equal value to those above mentioned, and private museums filled with the richest material.

¹ Edited by Prof. OTIS T. MASON, National Museum, Washington, D. C.

In the first place, though these institutions are presided over by men of great ability, there is a deplorable lack of mutual understanding and uniformity of method among them. There should be between those who hold in trust such vast treasures a better scientific method, a more wholesome comity of intercourse. In short, before we draw inferences we should know what and what kind of material we have in hand.

In the second place, investigations have been so increasingly fraught with grand results that some of the first efforts are likely to be ignored or forgotten. There are some points in the history of Squier's and Davis' work that have been misunderstood, and as the venerable authors are yet living it would seem a grateful tribute to bear them in mind. The earliest explorations of any great importance in the tumuli of the Ohio valley were made by Dr. Davis, who commenced a series of mound excavations while a student in Kenyon College from 1825 to 1833. The result of this first effort was published in some of the college papers.

Subsequently, Dr. Davis removed to Chillicothe, in the Scioto valley, celebrated for its earthworks. Here he laid out his plans for the great work which will forever be associated with his name.

After ten years of digging, plotting, mapping, and collecting, Dr. Davis was associated with Mr. Squier, and the fruit of their joint labors is the first Smithsonian contribution to knowledge, entitled "Ancient Monuments of the Mississippi Valley." When these first discoveries were made, comparatively little interest was manifested in American archæology. The objects recovered by the explorations of Squier and Davis, instead of remaining at home, were allowed to go abroad for want of a purchaser here. No one series of efforts since made approaches the latter in its detail and great results.

Recently the accuracy of the work done by Squier and Davis has been challenged, and this brings us to another phase of the question. Fully realizing the importance of criticism at any and all times, we still hold that a very important matter has been overlooked; it is this: The works of the mound-builders of a particular character or grade have not been compared with works of the same grade by their successors. If some of the best productions of artistic handicraft of the present Indians be compared with objects of a similar nature taken from the mounds it is more than doubtful if the superiority of the latter-day Indians can be substantiated. Generally woodcuts are published in this connection to show the low condition of the mound-builders' art. The cuts are copies of casts taken from inferior examples. Not one of the fine examples of mound-builders' work in hard stone has been figured in these comparisons. A few of the choicest specimens of this art are now in the possession of the Museum of Natural History, New York; others may be seen in almost every good cabinet in the country.

Now it is not a question of argument, but one of things. It is an easy matter to place things side by side, and there would be no question whatever of the superiority of mound-builders' work over that of every tribe known in historic times any where near the area occupied by them.

The pipes and other objects in hard stone should be compared not with pipes in catlinite and soapstone, but with objects in the same material.

The same is true of pottery. If we select from any or every collection the best evidences of form and finish and place by the side of them the best specimens of modern work by any tribe east of the Mississippi river there is a hopeless falling off.

Now it is but fair to infer that the people who so skilfully wrought in the hardest quartz, who made pottery in every way equal to that of the Pueblos, were not in the same grade as the tented savages whom our ancestors found upon our territory.

But the great, complicated earthworks of the mound-builders, so faithfully examined and reported by the old explorers, furnish the most important evidence of their superiority to their successors. It is true the southern Indians built mounds; but does any one seriously compare the works of the Natchez and Muskoki tribes with those of the mound-builders? The Iroquois made stockades and enclosures, and Mr. Morgan argued thence the works in Ohio were precisely similar in function. But this opinion cannot stand.

In conclusion, we desire to emphasize the importance of that pioneer work, so extended and so valuable to science. There are not many examples of such unselfish devotion. More than one hundred mounds were carefully opened, their contents gathered and arranged, over five hundred embankments and fortifications visited and surveyed in five States, the expense being borne by Dr. Davis. The magnitude and completeness of all this can only be appreciated by examination of "Ancient Monuments," and of the treasures collected, now in Blackmore Museum, London.—*J. B. Holder.*

AN IMPORTANT CONTRIBUTION TO CALIFORNIAN FOLK-LORE, linguistics and tribal topography is contained in the Bulletin of the Essex Institute of Salem, Mass. Nos. 1-3 of Vol. XVII (1885), pp. 33, and one plate. The author, Hugo Ried, wrote a series of letters from San Gabriel Mission to Mr. Coronel of Los Angeles, in 1852, concerning the Indians among whom he lived at the mission buildings. Twelve of these letters were published by Dr. W. J. Hoffman in the above periodical, together with copious notes of his own and drawings of the implements described in the letters. The subjects referred to are births, burials, food, medicine, diseases, sports and games, myths and legends, etc., all of which form interesting parallels to Father Boscana's Chirigchinich (in Robinson's Life in California, 1846). The first letter gives the Indian equivalents to the names of towns, harbors and

rancherías of the surrounding country; in letters 2, 3 and 4 are contained vocables, paradigms and the like of the San Gabriel language, which belongs to the Shoshondan family and has been variously termed Kish ("houses"), Tobikhar and San Gabriel dialect.—*A. S. Gatschet.*

KICHÉ GRAMMAR.—A short abstract of a *Kiché* grammar in Spanish, dated Santa Clara, Dec. 6, 1842, and composed by L. Aleman (pp. 26, 8vo), was sent by A. Blomme to the Congress of Americanists at Copenhagen (1883). The revises came in at so late a day that this elementary grammar could not be inserted in the *Compte-rendu* of that session, but the secretary ordered it to be struck off in a separate edition, a copy of which is before us. Mr. Blomme has given an historical account of the manuscript in the *Compte-rendu*, page 365. The grammar is written entirely in the old-fashioned way of the seventeenth and eighteenth centuries, when every missionary was sure to find the classifications and grammatic categories of Latin in any Indian language whatsoever. Aleman's *Kiché* cases of the noun, dative, ablative, etc., are simply postpositions connected with a noun; the verb *coh* is regarded as identical with the verb substantive, and a "subjunctive" is found to occur through all the tense-forms of this Guatemalteco language.—*A. S. Gatschet.*

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON, founded in 1879 by Dr. J. M. Toner, Professor Otis T. Mason and Col. Garrick Mallery, has just published its third volume of Transactions, extending from Nov. 6, 1883, to May 19, 1885. Among the papers included are the following, reported in full:

The Smithsonian anthropological collections for 1883. By Albert Niblack.

Discontinuities in nature's method. By H. H. Bates.

Elements in modern civilization. By J. M. Gregory.

Evidences of the antiquity of man on the site of the City of Mexico. By Wm. H. Holmes.

How the problems of American anthropology present themselves to the English mind. By E. B. Tylor.

The Eskimo of Baffin land. By Franz Boas.

Seal catching at Point Barrow. By John Murdoch.

On the probable nationality of the mound-builders. By Daniel G. Brinton.

Moral and material progress contrasted. By Lester F. Ward.

The genesis of invention. By F. A. Seely.

Sinew-backed bow of the Eskimo. By John Murdoch.

From savagery to barbarism. Address by J. W. Powell, president.

Papers by Messrs. Kengla, Dorsey, Holmes, Blodgett, Thomas, Ward, Thompson, Gallaudet, Burnett, Reynolds, Howitt, Mindeleff, Matthews, Henshaw, Stevenson and Gatschet are given in abstract, but, as they will be published elsewhere in full, no mention of their contents will be made here.

Mr. Bates draws attention to the seeming chasms in nature, such

as the passage from inorganic to organic life, from invertebrate to vertebrate, the introduction of the Mammalia, and followed the question into anthropology, noticing such breaks as the advent of man, and the phenomena of the inventive faculty.

Dr. Gregory discusses the phenomena of civilization from the side of human wants.

Mr. Holmes, during a visit to Mexico, had the good fortune to witness the making of a railroad cut and other excavations which revealed three periods—the ancient, the Aztec and the modern.

Mr. Tylor's delightful address has already appeared in *Science*.

Dr. Boas spent more than a year in Baffin land among the Eskimo visited by Capt. Hall and gave a sketch of the geography and ethnology of this region.

Mr. John Murdoch, for three years attached to the signal service at Point Barrow, Alaska, described the varied uses of the seal and the methods of capture with the retrieving harpoon, with the una harpoon and with the net, the most ingenious plan of all.

Dr. Brinton's short paper refers to the connection of the mound-builders with the Shawnees.

Professor Ward draws attention to the disharmony between material progress, or the accumulation of the means of happiness, and moral progress, or the ability to adapt these means to human well-being.

Colonel Seely presented an elaborate argument to show the application of modern methods of examining inventions to the early inventions of our race. The term eurematics was introduced for the study of the processes of invention in all human activities.

Major Powell's address was an elaborate analysis of culture or the humanities into arts, institutions, languages, opinions and intellections, and the discussion of the three great culture stages, savagery, barbarism and civilization, in relation to these forms of activities.

ETHNOLOGY OF BORNEO.—Everybody has heard of Professor Ward, of Rochester. Well, in 1876 he sent Mr. Wm. T. Hornaday to the East Indies equipped as a collector. This journey accomplished, after two years of wandering, the explorer returned to active work in his profession. He has found leisure, however, to write one of the most charming books of travels in India and Malaysia it has been our privilege to read. In this volume, *Two Years in the Jungle*, will be found excellent notes on the peoples of India and a thorough study of the people of Borneo.

The Dyaks are thus divided :

Kyans. All of the center and coming to the coast along the middle of the north-east shore.

Hill Dyaks. Uplands of north-west corner back of Sarawak.

Sea Dyaks. Uplands and coast east of Hill Dyaks.

Mongol Dyaks. Away from the coast in the entire north-east region.

The entire coast on the south-east and south-west side is left undescribed.

The tribes are as follows :

KYANS.	HILL DYAKS.	MONGOL DYAKS.
1. Kyans proper, (Baram, Rejang.)	1. Serambo.	1. Ida'an.
2. Milanaus.	2. Singgei.	2. Kadydu.
3. Kanowit.	3. Sentah.	3. Murut.
4. Ukit.	4. Selenkau.	4. Bisaya.
5. Bakatan.	5. Lara.	
6. Kiniahs.	6. Bukar.	
7. Skapan.	7. Engkroh.	
8. Maloh.	8. Engrat.	
9. Sibaru.	9. Milikin.	
10. Jankang.	10. Sou.	
11. Behoa.	11. Brang.	
12. Long Wai.	12. Sabungo.	
13. Long Wahoe.	13. Sinar.	
14. Modang.	SEA DYAKS.	
15. Tandjoeng.	1. Seribas.	
16. Saghai.	2. Saukarran.	
17. Eng ⁺ aya.	3. Ballow.	
18. Tring.	4. Sibuyau.	
19. Kahajang.	5. Batang Ayer.	
20. Orang Bukkit.	6. Lamanak.	
21. Punan.	7. Bugau.	
	8. Kantu.	

THE ESKIMO OF POINT BARROW.—The hyperborean peoples of America are usually called Eskimo without reference to the locality where they are found, but there are Eskemo and Eskimo. For classification I find it convenient to divide their habitat as follows :

1. Greenland.	7. Asiatic Eskimo.
2. Labrador and Ungava.	8. Cape Nome.
3. Baffinland.	9. Norton sound.
4. Mackenzie river.	10. Nunivak.
5. Point Barrow.	11. Bristol bay.
6. Kotzebue sound.	12. Kadiak and the main land.

For each of these regions the National Museum has sufficient material to illustrate the arts of the people.

During the years 1881, 1882, 1883, Lieut. Ray, U. S. A., occupied Point Barrow with a party sent out by the Chief Signal Officer of the Army. The report of the International Polar Expedition to Point Barrow, Alaska, just issued by the Government printing office is the fruit of this enterprise. Lieut. Ray has a chapter on the inhabitants, but the linguistics and ethnology are the work of Mr. John Murdoch. Ten pages are devoted to the language of the people, Major Powell's alphabet and Introduction being followed closely. Twenty-six pages are occupied with a

minute description of the collections, nearly 2000 specimens gathered with great care. In examining carefully this list and the accompanying drawings he was struck both with the generic similarities of hyperborean art and with the specific differences due to isolation. Pottery occurs in the list; labret lancets of slate for cutting the holes in the cheek for labrets; amber-beads made by the natives, and cups of fossil ivory. Of the implements, whose general form is widely diffused, Mr. Murdoch has collected a great variety of each class, showing that among these far-off people differentiation of structure for functional ends has been carried to a high degree of perfection. The Natural History chapters, also written by Mr. Murdoch must not be overlooked by the ethnologist, inasmuch as the life history of the people is intimately connected with the restricted fauna of this region.

Mr. Murdoch will publish in the near future a minute description of the Point Barrow Eskimo, including their arts and their customs, so far as he was able to gather facts concerning them.

It is certainly refreshing to follow a man who enters upon the work of exploration after a severe training under the elder Agassiz.—*O. T. Mason.*

THE BLOW TUBE IN THE UNITED STATES.—In all tropical countries where the cane grows the natives have become expert in the use of the blowing tube. The Indians of the Muskoki stock living in Southern Alabama, Mississippi and Louisiana have been known since the early explorations to have been expert in the use of this weapon. The Choctaws of our day take the longest and straightest cane they can find in the brake for their tube, and short pieces of split cane for their missile. One end is charred and scraped to a long slender point. The other is wrapped with a little strip of rabbit skin or a wad of cotton. With these the Choctaws are still expert in shooting rabbits, birds and fishes; for the latter using a barbed or retrieving arrow. These facts have been known and stated before, but what follows has never before, to our knowledge, been published. The Shetimasha Indians, about a hundred in all, living on a small bayou south of New Orleans, use the single barreled blow-tube precisely like that of the Choctaws, but they also have combinations of tubes, as we would say, viz., five barreled, eight barreled, &c., blow-tubes. They are made as follows: A number of tubes, in our collection ranging from five to eleven, of the same length and calibre are fastened securely together like a long pan-pipe by means of splints of split cane. The arrows are of split cane and vary at the point from the slender needle form to a broad arrow form. The butt end has a wad of cotton yarn 3 inches long fastened on like the bristles of a cylindrical brush. When the hunter wishes to use this weapon he loads his five or ten barrels and, stealing upon a flock of birds, lets drive the whole set one after another in quick succession. The superiority of such an arm over a single tube

is very great and it is singular that no other savages have ever studied it out.

The weapons herein described were presented to the National Museum by the Commissioners of the State of Louisiana at the New Orleans Exposition. At the same time many specimens of basketry and other handiwork made with great skill were forwarded. These also bear witness to the superior skill of the Shetimashas.

PHYSICAL EDUCATION OF CHILDREN. — Dr. E. Pokrovski, of Moscow, has published in *Ivestia of the Society of Friends of Natural Sciences, Anthropology, etc.*, xiv, fascicle 1, 2, 3, a treatise on the physical education of children among different peoples and particularly in Russia. The contents of the treatise are given, not only to show the line of thought, but to present the analysis of a most interesting subject :

Chapter I. Attention paid to the protection and development of the embryo, heredity, relations of the sexes, condition of woman, consanguine marriages, polygamy and polyandry, marriage in classical antiquity, care taken of pregnant women among ancient and modern peoples.

Chapter II. Abortion and infanticide; motives: superstitions, fear of monsters, misery, etc., legislation relative to abortion and infanticide.

Chapter III. Parturition and the condition of the new born.

Chapter IV. Care relative to the umbilical cord.

Chapter V. Dwelling of the infant in the family of the parents.

Chapter VI. Care of the skin.

Chapter VII. Bathing of infants.

Chapter VIII. Cold baths and baptism, in Europe, in Thibet, &c.

Chapter IX. Dressing of infants among ancient peoples and modern savages.

Chapter X. Dressing of Russian children.

Chapter XI. Enameling (*emmaillotement*).

Chapter XII. Kneading and rectification of the body of the infant.

Chapter XIII. Artificial deformation of the skull, ancient macrocephals, deformation among modern peoples, especially in Russia, Caucasia, Poland, Lapland, &c.

Chapter XIV. Influence of the infant's posture in its bed upon the deformation of the occiput, custom of bedding children among the Thracians, Macedonians, Germans and Belgians of the 16th century, and among the modern Asiatics. The form of the occiput in Russians of the Kourgans, from the craniological collections of Moscow.

Chapter XV. The cradle among different peoples.

Chapter XVI. The cradles of the Russians.

Chapter XVII. Cradles among other peoples of Russia, Tsiganis, Fins, Esths, Livonians, Laps, Poles, Jews, Lithuanians, Tcheremis, Bashkirs, Nogai, Sarts, Kirghiz, Kalmuks, Yakuts, Buriats, Tunguses, Soïotes, Woguls, Samoides, Goldoi, Koriaks, Kamtchadals, Caucasians, etc.

Chapter XVIII. Methods of putting children in their beds, of carrying them and transporting them, dependence on climate, mode of life; bearing them on the arm, back, neck, head, hip; in bag, paniers, chests, skins, &c.; customs of the Chinese, Negroes, Hottentots, American Indians, Kamchadales, Japanese, etc., in this regard.

Chapter XIX. Amusement of the child by the mother in Russia.

Chapter XX. Accustoming the child to sit and to go on all fours.

Chapter XXI. The upright position and walking.

Chapter XXII. Importance of food.

Chapter XXIII. Suckling among various peoples, ancient and modern.

Chapter XXIV. Among the Russians.

Chapter XXV. Among other peoples of Russia.

Chapter XXVI. Ethnic mutilations of children, tattoo, depilation, piercing the nose, the ears, the lips or the cheeks; filing and removing the teeth, castration, circumcision and similar mutilations; corset, Chinese feet, high heeled boots, &c.

Chapter XXVII. Games, sports and amusements of children.

Chapter XXVIII. Treatment of the maladies of children among different peoples. Popular child medicine in Russia, Germany, England, Switzerland, Dalmatia, among the Kalmucks, Kirghiz, Caucasians, ancient Hindoos, Iranians, etc.

Chapter XXIX. Care relative to the corporeal development of children and the means employed to toughen and fortify them; seclusion of children, asceticism, horsemanship, physical and warlike training of children among savages, etc.

Chapter XXX. Role played by animals in the education of man,—cows, goats, dogs, she wolves, apes, etc.

Chapter XXXI. Physical education among the children of Russian peasants, and the results.

Chapter XXXII. Conclusions.

MICROSCOPY.¹

OSMIC ACID AND MERKEL'S FLUID AS A MEANS OF DEVELOPING NASCENT HISTOLOGICAL DISTINCTIONS.²—In preparing embryological material for the microtome and the microscope, our choice of preservative fluids depends on the advantages offered in three principal directions. We inquire first of all what reagent, or combination of reagents, will best preserve the natural *form*, *relations* and *internal structure*. We next endeavor to ascertain which of the fluids appearing to satisfy the first point will leave the preparation in the most favorable condition for sectioning; and, finally, we have to consider the *differentiating capacity* of the fluids, and the conditions under which the highest differential effects can be obtained. This highly important quality, which belongs, in varying degree, to all hardening and staining reagents, serves two general purposes, one of which is purely histological, the other strictly embryological. In the one case, the aim is to sharpen the definition of individual elements, and to strengthen histological distinctions; in the other, the object is to demonstrate those subtle and imperceptible differences in the constitution of embryonic cells, which furnish the earliest premonitions of their histological destiny. The histologist deals with the first class of distinctions—the embryologist must deal with both. The embryologist cannot stop with the study of structure and topographical relations, as they exist in any particular stage; he is compelled to follow the entire developmental history of the cells, from their most indifferent up to their most highly specialized condition. Beginning with material more or less homogeneous in aspect, he finds it necessary to forestall development, and seeks to bring out distinctions that have not yet ripened into morpho-

¹ Edited by Dr. C. O. WHITMAN, Mus. Comp. Zool., Cambridge, Mass.

² Read before the American Society of Naturalists, December 30, 1885.